

REMARKS

With this Response, no claims are amended, added or canceled. Therefore, claims 41-65 are pending.

OATH/DECLARATION

Applicants understand that a new declaration is required. Please find submitted herewith a new oath and declaration, signed and dated by the second inventor.

CLAIM REJECTIONS - 35 U.S.C. § 103

Claim 41

Claim 41 was rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,790,070 of Natajara et al. (*Natajara*) in view of U.S. Patent No. 5,461,646 of Anvari (*Anvari*). Applicants respectfully submit that this claim is not rendered obvious by the cited references for at least the following reasons.

Claim 41 recites:

determining that an effective signal strength of a signal on a wireless communication link using signal diversity in one or more of the space, time, or frequency domains is insufficient to provide a desired communication range;
introducing signal diversity in an additional of the space, time, or frequency domains **into the wireless communication link** to generate multiple decorrelated signals corresponding to the signal **on the wireless communication link**; and
selectively combining the decorrelated signals and demodulating the combined, decorrelated signals to generate a representation of the content of the signal.

As with references cited in previous Office Actions, and addressed by Applicants in response to those Office Actions, *Natajara* and *Anvari* mention various types of signal diversity, but whether alone or in combination, fail to disclose or suggest introducing **additional** diversity into a wireless communication link, as recited in claim 41.

As an initial matter, Applicants submit that the interpretation of *Natajaran* as disclosing "determining ... to provide a desired communication range," is unsupported by the reference at least because *Natajaran* discusses satellite communication involving "several satellites 20 placed in relatively low or stationary orbits around the earth." Col. 2, lines 1 to 3. The satellites know a priori the desired communication range (i.e., the distance from their orbit to earth), and thus, do not "determine that an effective signal strength is insufficient to provide a desired communication range," as recited in claim 41. The entire discussion of *Natajaran* focuses on increasing bandwidth in established communication links, as discussed in more detail below. Thus, Applicants submit that *Natajaran* is inapplicable to the invention as recited in claim 41, and fails to support a rejection of the claim. To the extent that *Natajaran* could be interpreted as applicable to the claim, which Applicants do not concede, Applicants further submit that the reference fails to support the rejection in the Office Action for at least the following reasons.

Applicants note that *Natajaran* recites offering "flexible and dynamic sharing of network resources." Despite the mention of the word "dynamic" in the reference, Applicants further note that the reference fails to support the interpretation asserted in the Office Action at pages 2 to 3. *Natajaran* at col. 1, lines 34 to 39 recites:

A lack of responsiveness to **specific bandwidth requirements** leads to **allocating excess network resources** for many applications to meet worst case conditions. **Such allocation practices** reveal a certain **inflexibility** and inefficiency in network currently in use.

Emphasis added. As pointed out in the reference itself, the "inflexibility" that is being addressed is the "allocation practices" for specific bandwidth requirements. Furthermore, in contrast to what is asserted in the Office Action at page 3 (i.e., that the reference discloses the use of various forms of diversity as recited in the claimed invention), the reference further discusses the use of electromagnetic spectrum and states at col. 2, lines 52 to 58 that the manner of dividing the

spectrum and the use of multiple forms of diversity is **immaterial** to the discussion of the reference:

The present invention divides this spectrum into discrete portions or channel sets. For example, the spectrum may be divided into discrete frequency bands, discrete time slots, discrete coding techniques, diverse polarities, or a combination thereof. The precise manner of dividing this spectrum is also **unimportant** to the present invention.

Emphasis added. The reference continues to explain the use in the reference of the different forms of diversity at col. 2, lines 58 to 65:

Desirably, each of these discrete channel sets is "orthogonal" to all other channel sets. In other words, **simultaneous communications may take place at a common location over every channel set without significant interference**. The preferred embodiment of this invention assigns channel sets to macrocells 32 using a frequency, spatial, coding, and/or polarity diversity scheme that prevents interference between macrocells 32.

Emphasis added. Thus, as explained in the reference itself, each diversity scheme provides a different communication link to a common location. The use of the different forms of diversity in the reference provides different communication links. The reference fails to disclose or suggest introducing additional forms of diversity in a communication link, in contrast to the claimed invention.

The reference proceeds to discuss the use of varying time slot allocations (or "dwell times" as used throughout the reference) to provide better bandwidth usage. Thus, at col. 6, lines 50 to 58, the reference discusses the bandwidth allocation among the various communication links provided by the various forms of diversity. That section of the reference states in whole:

The present invention offers flexible and dynamic sharing of network resources. This is accomplished through a combination of demand-driven access techniques. The advantages of various forms of diversity, including the dimensions of space, time, code, frequency and polarization, can be achieved through the judicious combination of **hopping beam and scheduling techniques**. Previous methods were generally inflexible and could not adapt to change in real-time **variations of traffic and bandwidth requirements**.

Emphasis added. The hopping beam, as understood by Applicants from the reference refers to the use of the various forms of diversity to create multiple, separate communication links within the same geographical area, and the scheduling techniques refer to the allocation of time slots to the various communication links. In summary, the reference fails to disclose or suggest introducing **additional** diversity into a wireless communication link, as recited in claim 41.

Even assuming *Anvari* discloses what is asserted in the Office Action, which Applicants do not concede, *Anvari* is not cited as curing the deficiencies of *Natajaran* as set forth above, and indeed fails to do so. *Anvari* suffers the same defect as *Natajaran*, and fails to consider introducing additional diversity into a wireless communication link. Thus, the references, whether alone or in combination, fail to disclose or suggest at least one element of the invention as recited in claim 41, and so fail to support an obviousness rejection under MPEP § 2143.

Claim 42

Claim 42 was rejected under 35 U.S.C. § 103(a) as being unpatentable over *Natajaran* and *Anvari* in view of U.S. Patent No. 5,369,412 of Tsujimoto (*Tsujimoto*). Applicants respectfully submit that this claim is not rendered obvious by the cited references for at least the following reasons.

Claim 42 recites the following:

providing a wireless communication link with a level of diversity;
detecting a degradation of signal quality on the wireless communication link; and

dynamically introducing additional diversity on the wireless communication link to result in the wireless communication link having diversity in two or more of the space, time, or frequency domains in response to detecting the degradation of signal quality, to generate a plurality of decorrelated signals to be selectively combined with at least the use of a weight vector and demodulated to provide a representation of an originally transmitted signal.

The merits of *Natajaran* and *Anvari* with respect to introducing additional diversity on a wireless communication link are set forth above with respect to claim 41, and do not need to be reiterated here. Briefly, the Office Action at pages 3 to 4 uses with respect to claim 42 the same reasoning shown above to be based on an improper interpretation of the cited references. The addition of the *Tsujimoto* reference fails to cure the deficiencies of *Natajaran* and *Anvari*. The references, whether alone or in combination, fail to disclose or suggest at least one element of the claimed invention, and so fail to support an obviousness rejection of claim 42 under MPEP § 2143.

Claims 43-65

These claims were rejected under 35 U.S.C. § 103(a) as being unpatentable over *Natajaran*, *Anvari*, and *Tsujimoto*, in combination with a variety of references. Specifically, claim 43 was rejected in combination with U.S. Patent No. 6,643,494 of Worthy (*Worthy*); claim 44 was rejected in combination with U.S. Patent No. 6,591,382 of Molloy et al. (*Molloy*); claim 45 was rejected in combination with *Molloy* and U.S. Patent No. 5,722,051 of Agrawal et al. (*Agrawal*); claims 46-51 were rejected in combination with U.S. Patent No. 6,052,594 of Chuang et al. (*Chuang*) and U.S. Patent No. 6,170,075 B1 of Schuster et al. (*Schuster*); claims 52-54 were rejected in combination with *Chuang*, *Schuster*, U.S. Patent No. 3,195,049 of Altman et al. (*Altman*), and U.S. Patent No. 5,881,105 of Balachandran et al. (*Balachandran*); claim 53 was rejected in combination with *Chuang*, *Schuster*, *Altman*, *Balachandran*, and U.S. Patent No. 6,694,155 B1 of Chin et al. (*Chin*); claim 55 was rejected in combination with U.S. Patent No. 6,044,349 issued to Tolopka et al. (*Tolopka*); claim 56 was rejected in combination with *Tolopka*, *Molloy*, and *Agrawal*; claim 57 was rejected in combination with *Tolopka*, *Chuang*, and *Schuster*; claims 58-59 were rejected in combination with *Molloy*; claim 60 was rejected in combination with *Molloy* and *Agrawal*; claims 61-64 were rejected in combination with *Molloy*

and *Chuang*; and claim 65 was rejected in combination with *Molloy*, *Chuang*, *Schuster*, *Altman*, and *Balachandran*.

As explained above, each of these rejections is based on the defective rejection under *Natajaran*, *Anvari*, and *Tsujimoto*, as set forth above. These references are not cited as curing the deficiencies pointed out above, and Applicants submit that they indeed fail to cure the deficiencies set forth above. Specifically, claims 55 and 58 are independent and recite limitations similarly directed to the limitations discussed above with respect to *Natajaran*, *Anvari*, and *Tsujimoto*. Because the rejection fails under MPEP § 2143, these claims are nonobvious over the cited references. A claim that depends from a nonobvious base claim is also nonobvious. MPEP § 2143.03. Thus, the references, whether alone or in combination, fail to disclose or suggest at least one element of the claimed invention, and so fail to render obvious the invention as recited in these claims.

CONCLUSION

For at least the foregoing reasons, Applicants submit that the rejections have been overcome, placing all pending claims in condition for allowance. Such action is earnestly solicited. The Examiner is respectfully requested to contact the undersigned by telephone if such contact would further the examination of the present application.

Please charge any shortages and credit any overcharges to our Deposit Account number
02-2666.

Respectfully submitted,
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Date: 7/19/03

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